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Energy Conservation in Buildings and Community Systems Programme

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Ventilation Information Papers

Ventilation Information Paper n° 8

December 2004

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Energy Conservation in Buildings
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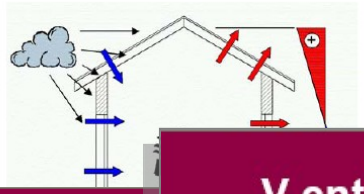
Air Infiltration and Ventilation Centre

Airtightness of buildings

V. Dorer, C. Tanner, A. Weber
EMPA, Switzerland



1 Introduction

If the building envelope is not airtight enough, significant amounts of energy may be lost due to exfiltrating air, or damage to structural elements may occur due to condensation. Air leakage can be avoided by appropriate design and careful construction. Test methods to check th airtightness and to locate the individual available and are increasingly used.

2 Importance of airtightness of buil envelope

Since ancient times, it has been commo that sealing cracks and joints, in the pas and clay, prevent cooling of the building draft risk, thus providing better thermal

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1 Introd

1.1 Defini

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1 Introducti

1.1 Basics

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September 2004

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Indoor Air Pollutants

Part 2: Description of sources and control/mitigation measures

Hal Levin
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1 Introduction

VIP Indoor Air Pollutants, Part 1 defined major types of indoor air pollutants, their measurement, and concentrations guidelines [Ref. 1].

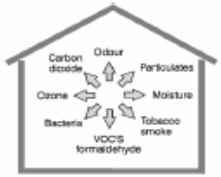
This VIP addresses the sources of pollutants and effective measures to control them or to mitigate their impacts on occupants and building contents. The most effective means to control indoor air pollution is through reduction or elimination of pollution sources. Indoor pollutants originate both within the building and from outside. The first step in controlling the sources of indoor air pollution is to identify them. Building materials, occupants and their activities, and equipment and appliances can all be sources of indoor pollutants. Once the sources have been identified, control strategies can be developed and implemented. Appropriate ventilation strategies can reduce concentrations of pollutants that can't be eliminated by source control. Air cleaning and filtration can reduce the concentrations of contaminants in buildings where ventilation systems recirculate air within the building.

For an introductory discussion of indoor air pollutants and concentrations, see reference 1.

2 Pollutant sources

2.1 Indoor sources

Controlling indoor air pollutants requires knowing their sources.



Most indoor air pollutants come from a variety of sources and activities indoors. These include housekeeping and maintenance products, occupant-related activities and sources, building use-related sources, building-related sources, HVAC systems, and others. Many of these sources can be controlled fully or partially while others cannot. Table 1 identifies pollutants commonly found in offices and many other building types and their sources within the buildings.

2.2 Outdoor sources

Outdoor air can be a source of pollutants from motor vehicle exhaust, commercial and manufacturing sources, public works/utilities, agriculture, construction, building maintenance, building exhaust, birds and rodents, ground and water sources. Contaminants from these sources frequently find their way inside through the building exterior, door and window openings, or other pathways. The best way to avoid contamination from outdoor air pollutants is to carefully locate the building away from such sources and to locate building ventilation air intakes distant from pollution sources.

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VIP 07	Indoor Air Pollutants – Part 2: Description of sources and control/mitigation measures	2004	168 kB
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